retrieval that can be used when standard snaring is unsuccessful have been recently described. The purpose of this study is to analyze how incorporation of these new techniques impacted the outcomes of IVCF retrievals at our institution over the past 5 years.

Methods: Data from all patients undergoing IVCF removal by vascular surgeons at a tertiary academic medical center between 2009 and 2013 were collected, including demographics, procedural and filter characteristics. A standard technique of snaring the retrieval hook was attempted first in all cases; if unsuccessful, a number of "fall-back" techniques were employed, including the use of endoscopic graspers, 18F sheaths, and snaring a second wire below the collar of the filter to collapse it into the sheath.

Results: A total of 274 patients underwent attempted IVCF retrieval; three were excluded intraoperatively due to thrombus in the filter. Most filters were Gunther Tulips (99%), 71% had been placed prophylactically prior to bariatric surgery. A total of 267 (98.5%) filters were retrieved successfully, 212 (79%) using standard snaring and 55 (21%) with "fall-back" techniques. In patients undergoing "fall-back" techniques, technical success was achieved 100% of the time. The median time since insertion was significantly longer in the "fall-back" group (173 days vs 70 days; $P < .0001$). Three intraoperative complications occurred: fractured wires embolized to the right atrium or pulmonary artery and were successfully removed endovascularly. The majority of the procedures (80%) were safely performed under sedation in both groups.

Conclusions: Incorporation of "fall-back" techniques may allow 100% technically successful and safe removal of retrievable IVC filters, and is especially useful in removing filters with prolonged dwell time.

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PS176.

Temporary IVC Filters That Are Not Retrieved: Clinical Predictors in 1000 Consecutive Cases

Ashley Vavra, Aaron Eifler, Dustin Yoon, Laura Boitano, Katherine Teter, Irene B. Helenowski, Mark K. Eskandari, Melina Kibbe, William Pearce, Mark Morasch, Deborah Epstein, Robert Lewandowski, Ramona Gupta, Jennifer Karp, Riad Salem, Robert Ryu, Heron Rodriguez. Northwestern, Chicago, Ill

Objectives: Compared with permanent filters, higher complication rates occur with long-term use of temporary filters. Our hypothesis is that clinical factors at the time of placement can predict the need for a permanent instead of a temporary filter.

Methods: An IRB-approved retrospective review was performed of both vascular surgery and interventional radiology prospective databases between 2008 and 2013. Protocols to maximize removal were in place. Patients were placed in group A if retrieval was attempted or group B if no retrieval attempt was made. Clinical factors for both groups were analyzed and compared (Table).

Results: Of 1,021 filters, removal was attempted in 60% (group A) and no attempt at removal in 40% (group B). Retrieval rate in group A was 95%. The most common reason removal wasn't attempted was lost follow-up. In the univariate model (Table), factors associated with permanence included male sex, old age, history or indication of venous thromboembolism (VTE) with inability to anticoagulate, malignancy, and neurologic condition. Factors most predictive of permanence in the multivariate model were malignancy (odds ratio, 3.0; $P < .001$) or neurologic disorder (odds ratio, 2.69; $P = .0005$).

Conclusions: Despite protocols, 40% of temporary filters were not removed. These patients are more likely to be older, male, have a malignancy or history of neurologic condition or VTE. These factors can be used prospectively to aid in deciding whether a permanent and not a temporary filter should be used.

Table. Univariate analysis of factors associated with filter permanence

	Group A (n= 619)	*Group B (n=405)*		
Factor	*No. (%)*	*No. (%)*	*OR (95% CI)*	P
Male sex	270 (44)	225 (62)	1.61 (1.25-2.07)	.00002
History of VTE	351 (57)	273 (67)	1.59 (1.22-2.07)	.0005
Malignancy	153 (25)	200 (49)	2.97 (2.27-3.88)	<.0001
Neurologic condition (CVA, paralysis, dementia)	24 (4)	35 (8)	2.35 (1.38-4.02)	.002
Indication				
VTE + AC contraindication	290 (47)	283 (70)	2.65 (2.07-3.46)	<.0001
VTE + AC complication	25 (4)	49 (12)	3.28 (1.99-5.40)	<.0001
VTE + AC failure	9 (1)	13 (3)	2.25 (0.95-5.32)	.06
High-risk VTE	63 (10)	20 (5)	0.46 (0.27-0.77)	.003
Prophylaxis	232 (37)	39 (10)	0.17 (0.12-0.25)	<.0001

AC, Anticoagulation; *CI*, confidence interval; *CVA*, cerebrovascular accident (stroke); *OR*, odds ratio; *VTE*, venous thromboembolism.

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PS178.

Leave 'Em or Retrieve' Em? Management of Inferior Vena Cava Filters

Courtney J. Warner[1], Anna E. Condino[2], Elizabeth A. Richey[2], Dyane E. Tower[2], Stephanie J. Tapp[2], Anna N. Tosteson[2], Daniel B. Walsh[1]. [1]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [2]The Dartmouth Institute for Health Policy & Clinical Practice, Lebanon, NH

Objectives: Inferior vena cava (IVC) filter placement is performed to mitigate the risk of pulmonary embolism

(PE) when anticoagulation is contraindicated or ineffective. Technical advances now allow catheter-based filter retrieval. Many believe the benefits of retrieval are self-evident, yet retrieval carries an inherent complication risk and cost. The purpose of this study was to quantitatively weigh the risks and benefits of IVC filter retrieval using formal decision analysis.

Methods: A Markov state-transition model was used to simulate two clinical scenarios: to leave a previously placed IVC filter or to retrieve it. Analysis was performed over the lifetime of the individual and outcomes were expressed in quality-adjusted life-years (QALYs). The base case is a 60-year-old man with a filter placed ≤3 months who no longer requires mechanical thromboprophylaxis. Potential events included PE, filter complications, and death from all other causes during each cycle. Tolls were used to incorporate the disutility of short-term treatment for PE and/or filter complications. For the base case and sensitivity analyses, we used utilities and probabilities derived from the literature.

Results: In the base-case scenario, leaving the filter in place was preferred to filter retrieval, yielding 22.3 vs 21.9 QALYs. One-way sensitivity analysis demonstrated that filter retrieval may be preferable if the utility of living with a filter is <0.98. For all probabilities of retrieval and PE mortality, leaving the filter in place is preferred.

Conclusions: Leaving a previously placed IVC filter provides a 0.4 QALY benefit over retrieving the filter for the average patient. This decision is sensitive to the utility of living with the IVC filter and underlying PE risk.

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PS180.

Open Surgical Reconstruction for Benign Superior Vena Cava Syndrome

Sameh Said, Peter Gloviczki, Manju Kalra, Audra A. Duncan, Gustavo S. Oderich, Mark D. Fleming, Randall R. DeMartino, Ying Huang, Thomas C. Bower. Mayo Clinic, Rochester, Minn

Objectives: To review long-term outcome of open surgical reconstructions for benign superior vena cava (SVC) syndrome.

Methods: The clinical data of all patients who underwent open reconstruction for benign SVC syndrome between 1989 and 2012 were retrospectively reviewed. Follow-up information was obtained from records, questionnaires, or phone calls.

Results: Forty-five patients, 29 females, 16 males (mean age, 41 years; range 4-69 years) with symptomatic SVC syndrome were included. Etiologies were central catheters (n = 20), fibrosing mediastinitis (n = 18), pacemaker leads (n = 2), and others (n = 5). Percutaneous recanalization was attempted in 14 patients, 10 underwent previous stenting. Full sternotomy was done in 44 patients, partial in one. The most common bypasses were left innominate vein to right atrial bypass in 30 patients (67%), and left innominate vein to SVC in eight (18%). Spiral vein graft was used in 21 patients (47%), expanded polytetrafluoroethylene (PTFE) in 13 (29%), femoral vein in 10 (22%), iliac vein homograft in 1 (2%). There was no early mortality. Two patients (4%) required early reoperation due to graft obstruction, one required early endovascular intervention. The mean follow-up was 6.2 ± 5.8 years (range: 1 month-21 years). Late mortality occurred in six patients (13%), all unrelated to the SVC reconstruction. Two patients required late reoperation for graft obstruction. Late angioplasty with or without stenting was required in 14 patients. One-year and 5-year primary assisted patency rates were 96% and 86%, secondary patency rates were 98% and 98%, respectively.

Conclusions: Benign SVC syndrome that is not suitable or that has failed endovascular treatment can be safely and effectively treated by open surgical procedures, using PTFE, femoral vein, or spiral vein grafts. Close surveillance and secondary endovascular procedures help assure excellent long-term durability.

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PS182.

Cost Analysis of Negative Pressure Wound Therapy with Instillation for Wound Bed Preparation Preceding Split-Thickness Skin Grafts for Massive (>100 cm^2) Chronic Venous Leg Ulcers

Sean Alcantara, Selena Goss, Jamie Schwartz, Cynthia Gendics, John Lantis. Vascular Surgery, St. Luke's Roosevelt Hospital, New York, NY

Objectives: The economic burden of venous leg ulceration (VLU) is well documented. Massive VLUs (>100 cm^2) in particular demonstrate very low closure rates with standard compression therapy. Split-thickness skin grafts (STSG) can be used in conjunction with negative pressure wound therapy (NPWT) as an alternative to standard of care. We performed a cost analysis of these two treatments.

Methods: We looked at cost effectiveness of twice weekly multilayer compression wraps compared with the following protocol: (1) surgical debridement, (2) 7 days of inpatient NPWT using a topical antiseptic (quarter strength Dakin's) instillation (NPWTi), and (3) STSG with 4 days of inpatient NPWT bolster over the graft. Cost was obtained through an independent, not-for-profit medical cost estimator, which estimated cost of a given Current Procedural Terminology code adjusted for region.

Results: We estimated the cost of 6 months of twice-weekly dressing changes to be $23,952, which included costs of office visits and dressing supplies. Cost of the proposed treatment protocol was estimated to be $26,624, which included an 11-day hospital stay and monthly follow-up visits.

Conclusions: The protocol of debridement, NPWTi using a topical antiseptic solution, and STSG with NPWT bolster, has the potential to be economically advantageous and a more effective alternative to standard compression